Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

In the Matter of	)	
	)	
Restoring Internet Freedom	)	WC Docket No. 17-108

COMMENTS OF ERICSSON

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July 17, 2017

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Ericsson submits these comments in response to the Commission's Notice of Proposed Rulemaking ("NPRM") in the above-referenced docket.[1]

INTRODUCTION AND SUMMARY

Over the years, Ericsson consistently has supported a framework for net neutrality that provides consumers with access to the content, applications, and services they want, while promoting continued investment, experimentation, differentiation, and innovation.[2] For operators, Ericsson's vision necessarily includes the freedom to manage their networks to assure that their users receive the quality and access that they have demanded. For content and application providers, Ericsson supports an environment that allows for customized experiences based on the demands of their customers.

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[1] *Restoring Internet Freedom*, Notice of Proposed Rulemaking, 32 FCC Rcd 4434 (2017) ("NPRM").

[2] *See generally* Comments of Ericsson, GN Docket No. 14-28 (filed July 17, 2014) ("Ericsson 2014 Comments"); Reply Comments of Ericsson, GN Docket No. 14-28 (filed Sept. 14, 2014) ("Ericsson 2014 Reply Comments"); Comments of Ericsson, GN Docket No. 09-191, WC Docket No. 07-52 (filed Oct. 12, 2010); Comments of Ericsson, GN Docket No. 09-191, WC Docket No. 07-52 (filed Jan. 14, 2010).

The 2015 *Title II Order*, however, produces none of these outcomes.[3] If left in place, the existing rules unnecessarily hinder the continued evolution of the broadband marketplace. This is not mere speculation: The Chief Financial Officer of Ericsson's North American operations describes in the attached declaration that since the adoption of the *Title II Order*, Ericsson witnessed decreases in U.S. wireless carriers' capital expenditures that, at least in part, likely are attributable to the Commission's reclassification of mobile broadband as a Title II service and its adoption of onerous net neutrality regulation.[4] Ericsson thus commends this Commission for initiating this proceeding to consider returning to a more reasonable framework for ensuring a free, open, and thriving Internet.

A course correction is more important now than ever – and in particular, for mobile broadband service. As Ericsson has explained, wireless is proof that under a "light touch" regulatory approach, the Internet can thrive.[5] Up until 2015, in the absence of strict net neutrality regulation and Title II classification for mobile wireless operators, competition grew, usage surged, prices dropped – and there were no signs of systemic consumer harms.[6] Indeed, competition in the mobile marketplace drove a consumer-centric approach under which no provider could risk alienating consumers by limiting their online access, as illustrated by operators' commitments to hew to the vision of an open Internet.[7] With continued and evolving

[3] *Protecting and Promoting the Open Internet*, Report and Order on Remand, Declaratory Ruling, and Order, 30 FCC Rcd 5601 (2015) ("*Title II Order*").

[4] Declaration of Jurgen Arts ¶¶ 5-6 ("Arts Decl.") (attached hereto).

[5] Ericsson 2014 Comments at 2-3.

[6] *Id.* at 2-3.

[7] *See id.* at 2, 5.

robust competition, there can be no valid concerns about providers making an anti-consumer pivot that undermines Internet openness.

The need to reconceive net neutrality regulation is even more urgent with the rapid emergence of 5G. The wireless industry is taking major steps to enable 5G deployment, forging ahead with the next generation of wireless technology that will deliver data faster, respond more quickly, and connect more devices. 5G will yield new use cases ranging from mobile high-definition video to self-driving cars to remote controlled robots to haptic feedback-enabled drones – and much, much more.[8] By 2022, 25 percent of mobile subscriptions in North America are expected to be 5G.[9] And many new use cases are expected to be primarily consumer-driven.[10]

The power of 5G is boundless – provided, of course, that the "Open Internet" framework does not stifle it. Indeed, inflexible rules could undermine the diverse 5G use cases and innovation enabled by quality-of-service ("QoS") distinctions and the availability of different levels of connectivity that could be made available as part of broadband Internet access offerings. A more realistic, effective, and efficient way to ensure Internet openness is to recognize that competition will drive pro-consumer outcomes and that any policy framework

[8] Ericsson, "5G use cases," https://www.ericsson.com/en/5g/use-cases. Of course, not all 5G-based offerings will be mobile broadband Internet access services.

[9] Ericsson, *Ericsson Mobility Report*, June 2017, at 9, *available at* https://www.ericsson.com/assets/local/mobility-report/documents/2017/ericsson-mobility-report-june-2017.pdf ("Ericsson Mobility Report").

[10] Glenn Laxdal, *Number Theories: What 100 Operators Really Think About 5G*, Ericsson Business Review, Issue 1, at 2 (2016), https://www.ericsson.com/assets/local/publications/ericsson-business-review/issue-1--2016/ebr-issue1-2016-5g-survey-100-operators.pdf.

should allow innovation, investment, and experimentation to flourish. Below, Ericsson describes several key elements of such an approach.

DISCUSSION

I. THE COMMISSION SHOULD REVERSE THE *TITLE II ORDER* AND RESTORE A MORE RATIONAL APPROACH TO INTERNET OPENNESS.

The NPRM properly recognizes that regulation in general and the *Title II Order* in particular "has put at risk online investment and innovation, threatening the very open Internet it purported to preserve."[11] Ericsson agrees, and urges the Commission to use this overarching cautionary note as a guide throughout this proceeding. This guidepost, moreover, is particularly important for mobile services, which warrant regulatory treatment that accounts for the highly competitive nature of the mobile marketplace.[12]

A. The Current Framework Risks Impeding Online Innovation and Investment.

Ericsson consistently has conveyed its concern that an overly regulatory approach to net neutrality will quash innovation.[13] Restrictive rules can bar innovation, discourage businesses from taking chances, and add costs to doing business. With 5G, for example, today's rules put companies at risk in developing new customized services within broadband Internet access offerings that may legitimately treat different bits with different priorities, when they face the prospect of being told, after the fact, that they crossed a line they did not know existed.

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[11] NPRM, 32 FCC Rcd at 4435 ¶ 4; *see also id.* at 4448-52 ¶¶ 44-51.

[12] *See, e.g.*, Ericsson 2014 Comments at 2-6, 10; Ericsson 2014 Reply Comments at 3-5.

[13] *See, e.g.*, Ericsson 2014 Comments at 5, 11; *see also* Jared Carlson & Walter Van der Weiden, *Keeping the Internet Open for Innovation: A Perspective on the Net Neutrality Debate*, Ericsson Business Review, Issue 3, at 1 (2015), https://www.ericsson.com/assets/local/publications/ericsson-business-review/issue-3--2015/ebr-issue3-2015-net-neutrality.pdf ("Carlson & Van der Weiden").

The Commission's imposition of Title II regulation – and in particular, its adoption of the amorphous general conduct standard and the categorical prohibition against paid prioritization – forecloses offerings and business models that could have important consumer, commercial, and public safety benefits. Ericsson has long maintained that the open Internet must permit operators to deliver differentiated user experiences.[14] Fostering an environment that encourages differentiated services is important because some online activities require only a minimal amount of bandwidth but extremely low latency; other uses may require greater bandwidth. Application, service, and content providers should be able to cater to this entire range of preferences. In the future, people and devices will make use of the network in more diverse ways than we can conceive. These different use cases will demand networks provide a far more heterogeneous set of functionalities than that needed to support apps on a mobile smart phone.

Network slicing is an emerging technology that illustrates what is at stake. Network slicing allows multiple logical networks to be created on top of a common shared physical infrastructure. It is an important capability that will enable flexibility, as each customized network slice matches the level of delivery complexity required by different supported services. For instance, different network slices can provide (i) connectivity for smart meters with high availability and high reliability data-only service, with a given latency, data rate and security level, and (ii) connectivity for an augmented reality service with very high throughput, high data speeds, and low latency. Providers of applications, services, and content can then use discrete

[14] *See, e.g.*, Ericsson 2014 Comments at 6-8; Ericsson 2014 Reply Comments at 1-2.

network slices as their services dictate and as their customers demand, including in ways that cannot yet be imagined.[15]

Network slicing thus is key to the growth of the diverse devices and services that comprise the Internet of Things ("IoT"). As Ericsson has explained, because not all IoT connections place equal demands on the network, an inflexible version of net neutrality in this context could harm innovation.[16] The notion that every data bit sent between connected cars should be treated with the same degree of priority as email traffic or that an augmented reality service is barred from obtaining a certain quality of service ignores the difference in requirements of the devices, applications, and users (not all of whom will be human) that will increasingly connect to the wireless Internet.

Broadband regulation can and should account for and promote these sorts of benefits. Recently, the European Parliament considered the benefits of network slicing in the context of its 5G policies. For instance, the European Commission's recommendations for promoting 5G innovations observed that network slicing facilitates the provision of "various levels of service quality and reliability over the same physical network."[17] As a result, this technology "will lower market-entry barriers for customised communications service in multiple sectors, by giving controlled access to real or virtual network resources without the need to own a whole network

[15] More information on network slicing is available at: Ericsson, Network Slicing, https://www.ericsson.com/en/networks/topics/network-slicing.

[16] Ericsson 2014 Reply Comments at 5-6.

[17] European Commission, *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, 5G for Europe: An Action Plan*, at 10 n.40 (Sept. 14, 2016), https://ec.europa.eu/transparency/regdoc/rep/1/2016/EN/1-2016-588-EN-F1-1.PDF.

infrastructure."[18] Ericsson, for example, recently announced that it will lead a new connected car initiative in Europe focused on developing a 5G system architecture for end-to-end vehicle-to-everything ("V2X") network connectivity.[19] As a policy analysis prepared for the European Parliament also notes, "a 'slice' of the 5G network could be used for a specific purpose, perhaps for much lower speed data and charged for on a proportional usage basis. This could be attractive for dedicated industrial networks that may have much slower speed[] requirements."[20]

Today's restrictive net neutrality regime, in contrast, puts this at risk. Any limitation on this sort of customization could have the further effect of prohibiting network slicing, whether under a flat ban on paid prioritization or the general conduct rule. Yet that is the outcome courted by the *Title II Order*. Networks have the technological capability to provide an array of beneficial, differentiated services to consumers. But because the existing regime discourages operators from making such offerings (and may even penalize them for doing so), that potential may not be realized and consumers may never see what they are missing. A reasonable framework is one that allows operators to optimize the technical ability of networks to provide consumers with benefits they could not otherwise imagine – not one that restrains operators from pursuing that vision.

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[18] *Id.* at 10.

[19] *See, e.g.*, Gareth Corfield, *Ericsson leads 5G connected car gang towards pot of EU gold*, The Register, June 8, 2017 (noting that Ericsson "is leading a coalition tasked by the EU with building a 5G V2X network for connected cars"), https://www.theregister.co.uk/2017/06/08/-ericsson_5gppp_connected_car_eu_funding/.

[20] European Parliament, Directorate General for Internal Policies, Policy Department A: Economic and Scientific Policy, *European Leadership in 5G: In-Depth Analysis for the ITRE Committee*, at, 12, 14 (Dec. 2016), http://www.europarl.europa.eu/RegData/etudes/IDAN/2016/595337/IPOL_IDA(2016)595337_EN.pdf.

As the NPRM observes, net neutrality regulation and Title II reclassification threatens network investment as well.[21] This is not a surprise – it is instead a predicable consequence of regulation in this space. Ericsson's annual reports going back to 2010 have consistently emphasized the risk of net neutrality rules for the operations of Ericsson and its customers, noting in particular that such rules could "affect operators' ability or willingness to invest in network infrastructure."[22] The evidence suggests that these concerns have come true. The NPRM notes one recent study finding that the combined capital expenditures among the nation's twelve largest broadband Internet access providers has declined 5.6 percent relative to 2014 levels.[23] And elsewhere, the Commission has found that mobile providers' capital expenditures declined 3.2 percent between 2014 and 2015.[24] One recent study found that the cumulative decline in annual wireless capital investment during the three years that the Commission considered and then imposed regulation through the *Title II Order* – that is, 2014 to 2016 – was $6.8 billion, or around 20 percent, with $5.6 billion of that in 2016, the first full year the new rules were in

[21] NPRM, 32 FCC Rcd at 4435 ¶ 4 (stating that, following adoption of the *Title II Order*, "Investment in broadband networks declined. Internet service providers have pulled back on plans to deploy new and upgraded infrastructure and services to consumers.").

[22] *See, e.g.*, Ericsson Annual Report 2010, at 123, https://www.ericsson.com/assets/local/investors/documents/financial-reports-and-filings/annual-reports/ericsson_ar_2010_en.pdf; Ericsson Annual Report 2016, at 125 (same), https://www.ericsson.com/assets/local/investors/documents/2016/ericsson-annual-report-2016-en.pdf.

[23] NPRM, 32 FCC Rcd at 4448-49 ¶ 45 (citing Hal Singer, *2016 Broadband Capex Survey: Tracking Investment in the Title II Era* (Mar. 1, 2016)).

[24] *Implementation of Section 6002(b) of the Omnibus Budget Reconciliation Act of 1993, Annual Report and Analysis of Competitive Market Conditions With Respect to Mobile Wireless, Including Commercial Mobile Services*, Nineteenth Report, 31 FCC Rcd 10534, 10553-54 ¶ 24 & Chart II.D.1 (2016) ("Nineteenth Report").

effect.[25] The same report found that wireless capital investment also declined as a percent of revenue – decreasing from 18 percent in 2016 to 14 percent in 2016 – and per subscriber – decreasing 32 percent from $98.74 down to $66.67.[26]

Ericsson's own experience mirrors these trends. Ericsson saw the market change after unnecessary rules were applied to it. As detailed in the attached declaration, after the May 2015 *Title II Order*, carrier wireless CAPEX spending dramatically decreased; first quarter 2016 carrier wireless CAPEX was at an all-time low, and overall for the year, carrier wireless CAPEX dropped steeply, by 4.4 billion dollars from 2015.[27] Concurrently, Ericsson's North American revenues likewise experienced a decline, with a decrease of 14 percent in 2015 and 7 percent in 2016, following a period of tremendous growth between 2009 and 2013.[28] While this negative revenue trend was attributable to more than one factor, the adoption of the *Title II Order* in between the upward and downward trajectories, and its dampening effect for broadband in general and mobile broadband in particular, cannot be ignored.[29]

Finally, net neutrality regulation can constrain private negotiations and thereby prevent parties from securing mutually beneficial arrangements. Accordingly, Ericsson supports the NPRM's proposal that the Commission relinquish any authority over Internet traffic exchange.[30] As the NPRM notes, the *Title II Order* did not stop at regulating the provision of retail

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[25] Anna-Maria Kovacs, *Has Title II Regulation Stifled Wireless Investment? Here's What the Numbers Say*, Wireless Week, June 15, 2017, https://www.wirelessweek.com/article/2017/06/has-title-ii-regulation-stifled-wireless-investment-heres-what-number-say (summarizing CTIA statistics).

[26] *Id.*

[27] Arts Decl. ¶ 5.

[28] *Id.* ¶ 6.

[29] *Id.* ¶¶ 7-8.

[30] NPRM, 32 FCC Rcd at 4448 ¶ 42.

broadband Internet access but went further by asserting a right to scrutinize, on a case-by-case basis, peering and interconnection agreements that historically were the subject of private negotiations that functioned well without any regulatory intervention.[31] But regulatory oversight unnecessarily constrains parties that have become accustomed to negotiating privately – and successfully – without regulatory intervention. The Commission should use this opportunity to reverse the *Title II Order*'s encroachment into the regulation of Internet traffic exchange.

B. The Highly Competitive Nature of the Mobile Services Marketplace Warrants Limited Regulation.

The experience with mobile services to date demonstrates why regulation is unnecessary. Prior to 2015, the only net neutrality requirements placed on wireless broadband operators had been a prohibition against the blocking of video and voice telephony apps that competed with the operators' own offerings, and transparency rules.[32] Theoretically, under those minimal rules, if an operator did not offer its own video chat app, it could have gone so far as to block Skype's video calling capability. That no operator actually did so, or even engaged in activity that approached blocking or throttling of service, is testimony to the power of competition and the discipline of the market.[33]

In 2015, the Commission's majority nonetheless determined in the absence of any evidence that wireless broadband access should be subject to the *even* more onerous rules of the 2015 *Title II Order*.[34] That decision failed to account for the robust nature of mobile broadband

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[31] *Id.*; *see also Title II Order*, 30 FCC Rcd at 5692-93 ¶¶ 202-03.

[32] *Preserving the Open Internet*, Report and Order, 25 FCC Rcd 17095, 17959-60 ¶ 99 (2010) (describing the transparency rules and prohibition on blocking basic browsing and applications that compete with operators' voice and video offerings).

[33] *See, e.g.*, NPRM, 32 FCC Rcd at 4452 ¶ 50.

[34] *Id.* at 4462 ¶ 85.

competition and its impact on delivering a free and open Internet to consumers and providers alike.

Competition is greater today, as is the marketplace's disciplining effect regarding Internet openness. There are now 380 million mobile subscriptions in North America, a number which is expected to grow to 430 million by 2022.[35] North American subscribership is above 100 percent penetration, as consumers now have multiple connected devices such as smartphones and tablets and, as times goes on, the number of connected IoT devices (such as connected cars) will grow.[36] And subscribers increasingly are able to choose from among a variety of providers: 99.3 percent of Americans in non-rural areas have a choice of at least three providers of 4G LTE (80.6 percent in rural areas);[37] the options are becoming greater still as cable companies and others seek to enter the marketplace.[38] Moreover, as discussed above, the emergence of 5G promises services that will deliver data faster, respond more quickly, and connect more devices.[39]

Given this increase in competition, the case against net neutrality regulation and Title II reclassification is even stronger now than it was at the time of the 2015 *Title II Order*. In light of such evidence, there should be little question about the need to change course – and the need to do so promptly. Leaving the existing regime in place will simply prolong and exacerbate this drag on investment.

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[35] Ericsson Mobility Report at 35.

[36] *Id.* at 5 (measuring broadband penetration in North America at 106 percent, as the number of subscriptions per user).

[37] Nineteenth Report, 31 FCC Rcd at 10567 Chart III.A.5.

[38] *See, e.g.*, Press Release, *Comcast, Comcast Introduces Xfinity Mobile: Combining America's Largest, Most Reliable 4G LTE Network and the Largest Wi-Fi Network* (Apr. 6, 2017), http://corporate.comcast.com/news-information/news-feed/comcast-xfinity-mobile.

[39] *See supra* at 2-3.

II. THE COMMISSION'S LEGAL ANALYSIS MUST TAKE INTO ACCOUNT THE PERSPECTIVE OF USERS OF BROADBAND INTERNET ACCESS.

For the reasons discussed above, the Commission should revisit its Title II classification analysis. Here, Ericsson focuses on one critical component of that legal analysis that the Commission should correct: the determination of what broadband providers actually "offer" to consumers.[40]

The Supreme Court has made clear that what is being "offered" should be judged by the eye of the consumer: "It is common usage to describe what a company 'offers' to a consumer as what the consumer perceives to be the integrated finished product."[41] But the *Title II Order* erroneously found that consumers view broadband Internet access service as consisting of two distinct components – (i) transmission (or a "conduit") offered by the BIAS provider, and (ii) content, apps, and services offered by unaffiliated third parties.[42] That conclusion, however, ignored extensive evidence that consumers more typically view broadband as a single, integrated service that provides functionalities above and beyond mere transmission.[43] That evidentiary record did not signal any sort of change in circumstance. Before adopting the *Title II Order*, the Commission had determined no fewer than four times that broadband Internet access is an interstate information services because, when viewed from the perspective of the end user, the

[40] 47 U.S.C. §§ 153(53), 153(24) (defining "telecommunications" and "information service" based on what is being offered to the customer).

[41] *National Cable & Telecomm. Ass'n v. Brand X*, 545 U.S. 967, 990 (2005).

[42] *See, e.g.*, *Title II Order*, 30 FCC Rcd at 5755 ¶ 350 ("[A]s a practical matter, broadband Internet access service is useful to consumers today primarily as a conduit for reaching modular content, applications, and services that are provided by unaffiliated third parties.").

[43] *See, e.g.*, Comments of AT&T Services, Inc., GN Docket No. 14-28, at 48-49 (filed July 15, 2014) (describing data-processing components integrated with broadband transmission); *Title II Reclassification and Variations On That Theme: A Legal Analysis*, Oct. 29, 2014, at 5-9, attached to Letter from Michael E. Glover, Verizon, to Marlene H. Dortch, Secretary, FCC, GN Docket No. 14-28 (filed Oct. 29, 2014).

telecommunications component of BIAS "is part and parcel" of the service and "integral to its other capabilities."[44]

The NPRM returns to that longstanding view, positing correctly that BIAS providers offer far more than mere transmission and instead enable users to engage in the various online tasks enumerated in the statutory definition of an "information service."[45] In fact, consumers demand and expect this sort of integrated service; they do not merely want a conduit. This is even truer today, when customers increasingly want innovations from their broadband providers such as differentiated QoS.[46] Ericsson supplies functionalities that operators seek in order to respond to these demands; there are the very sort of data-processing capabilities that are "inextricably intertwined" with the transmission aspect of broadband Internet access.[47]

As the marketplace evolves, the *Title II Order*'s classification decision becomes more and more antiquated. The Commission should sync up this key aspect of its classification analysis with broadband reality.

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[44] *Inquiry Concerning High-Speed Access to the Internet Over Cable & Other Facilities; Internet Over Cable Declaratory Ruling; Appropriate Regulatory Treatment for Broadband Access to the Internet Over Cable Facilities*, Declaratory Ruling and Notice of Proposed Rulemaking, 17 FCC Rcd 4798, 4823 ¶ 39 (2002); *see also* NPRM, 32 FCC Rcd at 4438-39 ¶¶ 11, 14, 16-17 (citing previous Commission classification decisions that focused on the functions made available to end users and finding that broadband provided over cable systems, wireline facilities, power lines, and wireless networks all provided transmission inextricably intertwined with computer processing and interactivity).

[45] NPRM, 32 FCC Rcd at 4442 ¶ 27 (citing 47 U.S.C. § 153(24)).

[46] *See* Carlson & Van der Weiden at 2 & n.3.

[47] *See, e.g.*, Ericsson, Ericsson IPWorks, https://www.ericsson.com/ourportfolio/it-and-cloud-products/ipworks?nav=productcategory022%7Cfgb_101_147 (describing DNS and DHCP features).

III. CONGRESS SHOULD STEP IN AND ADOPT AN OPEN INTERNET FRAMEWORK THAT IS REASONABLE, SUSTAINABLE, AND NATIONWIDE.

There is a clear need for a course correction that puts broadband policy on a path that promotes consumer welfare, innovation, and investment. But the back-and-forth of net neutrality policy resulting from court decisions and changes in Commission leadership underscores the importance of Congress taking action to set reasonable net neutrality policy. Without legislation, the current flux (or even the risk of it) creates significant uncertainty about whether any regime currently in place will remain intact, and the prospect of toggling between opposing frameworks risks grinding innovation to a halt.

Congress has a unique ability to put in place a nationwide net neutrality framework that leaves no doubt about national policy in this area. Indeed, as the NPRM itself highlights, Congress played an indispensable role in shaping the pro-innovation Internet policies that prevailed for most of the past two decades before the adoption of the *Title II Order*.[48] Ultimately, a congressional net neutrality framework may well be the surest path toward a framework that is reasonable, sustainable, and nationwide.

[48] *See generally* NPRM, 32 FCC Rcd at 4435-38 ¶¶ 1-10 (describing Congress's passage of the 1996 Act and noting the Commission's adherence to congressional advice that applying utility regulation to the Internet "seriously would chill the growth and development of advanced services to the detriment of our economic and educational well-being").

CONCLUSION

As Ericsson previously has observed, the rest of the world looks to the U.S. on issues like net neutrality.[49] This rulemaking provides an opportunity for the Commission to reassert U.S. leadership and once again provide a model for broadband regulation in the modern era. Ericsson looks forward to working with the Commission and other stakeholders to achieving that outcome.

Respectfully submitted,

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[49] Ericsson 2014 Comments at 16-17.

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DECLARATION OF JURGEN ARTS

1. My name is Jurgen Arts. I am the Chief Financial Officer ("CFO") of Ericsson's North American operations. In that role, I have direct oversight over all financial activities involving Ericsson in the United States and Canada.

2. I have been at Ericsson for the past 19 years, and have held a number of other senior management roles within the company, including CFO for Ericsson Latin America and Caribbean. I hold a Bachelor of Science in Economics from Tilburg University in the Netherlands, an MBA from IESE Business School in Madrid, Spain, and have completed post-graduate work at the Stockholm School of Economics, Sweden, and Columbia Business School, New York.

3. As CFO, I have direct knowledge of Ericsson's current performance in North America and of our financial history over the past several years. I am personally responsible for the accuracy of Ericsson's North American Financial Statements, including market implications.

4. The vast majority of Ericsson's U.S. revenues are attributed to the largest four U.S. carriers' CAPEX spend. So, we are impacted when they decrease their CAPEX spend.

5. After the May 2015 *Open Internet Order*, carrier wireless CAPEX spending dramatically decreased. In particular, first quarter 2016 carrier wireless CAPEX was at an all-

time low, and overall for the year, carrier wireless CAPEX dropped steeply, by 4.4 billion dollars from 2015.

6. Ericsson's North American revenues likewise experienced a decline, with a decrease of 14 percent in 2015 and of 7 percent in 2016. By contrast, Ericsson experienced tremendous growth in North American revenues during the period 2009-2013.

7. Of course, there was more than one factor at play in the negative revenue trend for Ericsson in North America. But, one cannot ignore the fact that the FCC reclassified mobile broadband as a Title II service and adopted highly restrictive "net neutrality" rules in 2015. Most of our customers reacted negatively to the adoption of those rules and to the reclassification decision.

8. I believe that one of the factors contributing to the lower levels of Ericsson's North American revenues in the 2015-2016 period when compared to the 2009-2013 period was the dampening effect of the reclassification of mobile broadband as a Title II service and the adoption of net neutrality rules on the broadband industry, and in particular, on wireless broadband.

9. This concludes my declaration.

I, Jurgen Arts, declare under penalty of perjury that, to the best of my knowledge, the foregoing is true and correct.

Jurgen Arts
Chief Financial Officer
Ericsson, North America

Dated: July 17, 2017